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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/697,950
Filing Date: October 31, 2003
Appellant(s): GOLNER ET AL.

Baker & Hostetler LLP
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 1, 2007 appealing from the Office action mailed January 17, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

08-2292	YOSHIYUKI et al.	1-1996
6,518,694	GOLNER et al.	6-2003
5,946,171	MAGNIER	8-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-16, 18 and 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 8-2292 machine translation (certified translation ordered and will be mailed to applicant and Board of Patent Appeals when received) in combination with Golner et al. further in view of Magnier.

JP 8-2292 teach an on-load tap changer which includes a gas analyzer which analyzes the mixing of gas of the insulating oil in the insulating material contain, and determining whether

an abnormality of the type of gas is detected and then is connected to a diverter switch and tap selector changer which is changed based on the abnormalities detected. Specifically the gas analyzer is used to detect whether there is an abnormality in the transformer or whether there is a problem with an on-lead tap changer. Specifically in column [0015 to [0018] An on load tap changer 20 is hung from top tank covering 1a and is attached in the interior of the transformer tank 1. An on-load tap changer is equipped with a diverter switch and a tap selector, which is both, stored in the insulating material container 7 with which insulating oil is filled. The insulating material container 7 is sampled through oil feed tube 10, and the diagnostic equipment 30 which diagnoses abnormalities form a gas analysis result is attached. A judgment is made by the analyzer of the gas extractor (12) for analyzing the gas currently mixed in insulating oil. Oil is extracted from the on-load tap changer, the sent oil is sent to a gas extractor (12) which includes a gas permeable membrane (13) of a macromolecule, which dissociates through the filter member and the oil is accumulated in the measuring tube 15.

Although JP 8-2292 does not teach that a non-reactive gas is injected into the load tap changer, there is a specific teaching that there is gas present in the mineral oil, the gases present are detected and are analyzed in order to evaluate the conditions of the load tap changer and/or transformer. JP 8-2292 does not specifically teach injecting nitrogen or a non-reactive gas into an ullage in the load tap changer.

Golner et al. 6,581,694 teaches a method and system for controlling the supply of nitrogen to in the ullage of a power transformer that has its windings submerged in oil. A nitrogen generator supplies nitrogen from a nitrogen reservoir from which it is distributed to the ullage as well as to accessories such as load tap changer or a control box. [Note the abstract]. There is a clear suggestion and teaching in Golner et al. that the system that controls nitrogen pressure in the ullage of power transformer having its windings submerged in oil can also be

used in other electrical power handling equipment with electrical components submerged in oil with a ullage [Note Column 2, lines 50-55]. It is the position taken by the examiner that the power transformer is only a preferred example of the type of electrical power handling equipment wherein a nitrogen generator can be used for injecting nitrogen into the ullage so that there are means to expel the vapor phase contaminants from the ullage of the power transformer or from a tap load changer. Golner et al. specifically teaches that it is within the scope of the invention to use the nitrogen generator and supplying nitrogen to an electrical power handling equipment which includes power transformers with oil. Golner et al. teach that the nitrogen generator includes a high pressure nitrogen source, a nitrogen reservoir, a pressure control device, check valve, pressure transducer and a manifold.[Note Column 3, lines 8-38] The nitrogen generator includes a prefilter, a compressed air supply, a separation membrane, a waste gas port, a nitrogen port and a temperature regulator. A prefilter filters particulate and vapor contaminates harmful to the separation membrane.

Magnier teaches a method and device for prevention against explosion and fire or electrical transformers wherein the electrical transformer is filled with a mineral oil. A pressure sensor and vapor senor is coupled to the enclosure to monitor the pressure and vapor content of the mineral oil in the enclosure. An increase in pressure of the enclosure can indicate abnormalities. If an abnormalities is detected the mineral oil coolant is drained from the system. Specifically taught in Magnier is to inject and inert gas such as nitrogen into the bottom of the transformer which windings are insulated in a mineral oil or coolant, the injection of the inert gas causes stirring of the coolant (mineral oil) which equilibrates the temperature and makes it possible to flush or expel oxygen present in proximity to the fluid. A sensor detects the presence of the coolant vapor; the deflagration due to an electrical insulation break rapidly cases the release of the vapor which is detected from the fluid within the enclosure. The vapor

senor is therefrom highly expedient in detecting g a break in the electrical insulation. Magnier further teaches that nitrogen injection in on load tap changer has also been contemplated and that there are means provided so that the expelled gas from the on load tap changer can be prevented from exploding by using a trigger and gas sensor wherein the inert gas is used to expel gases from the fluids contained in with the transformer or on load tap changer.

It is maintained that the combined teachings of JP 8-2292, Golner et al. and Magnier fully teaches and suggest providing an apparatus which includes a on load tap changer which contains mineral oil, an orifice to inject an inert gas, non-reactive gas specifically nitrogen into the on load tap changer for expelling a vapor phase contaminant from the mineral oil from the ullage in the load tap changer and teaches monitoring, gas analysis pressure analysis and control which monitors the conditions inside the load tap changer which has been claimed specifically in independent claims 1, 20 and 24. It is maintained that the art recognizes and teaches an apparatus and process for controlling the environment specifically the oil within a load tap changer which includes means for urging nitrogen into an ullage in the load tap chamber, and means for monitoring the conditions inside the load tap chamber and mans for expelling vapor phase contaminants form the ullage in the load top changer. With respect to applicant dependent claims, the which separates nitrogen from air, pressure regulation, output venting rate these limitations would not impart patentability to the invention as these are all obvious expedients in injecting gases, withdrawing gases, preventing explosion in electrical handling equipment being insulated in mineral oil which has been taught and recognized by the prior art. JP 8-2292, Golner et al. and Magnier when read in light of their specification, claims, drawings, background of the invention teaches an apparatus and method capable of injecting a non-reactive gas into a LTC, expelling entrained vapor phase contaminants from the LTC ullage which will prevent explosion and/or arcing deleterious effects to the LTC and other electrical

power handling equipment which is insulated by mineral oil. JP 8-2292 teaches specifically using gas analysis and removing gases from mineral oils specifically from an LTC, Golner et al. teaches injecting nitrogen into power handling equipment for the same reasons and using the same type of nitrogen generating equipment used specifically in the LTC as claimed. There is a suggestion in Golner et al. that the power generating equipment is not limited to only power sources or transformers but can include a LTC. Magnier teaches specifically injecting nitrogen into a power handling system such as a transformer and LTC combination, there is a specific teaching in Magnier to inject nitrogen into a the LTC. The prior art renders applicant's invention as a whole obvious to one having ordinary skill in the art at the time the invention was made.

(10) Response to Argument

Appellants argue that the applied art does not teach or suggest all the claim limitations. The examiner respectfully disagrees with appellants. Claim 1, requires a load tap changer, which is connected to a source of non-reactive gas, a feed line configured to introduce the non-reactive gas into a ullage (which is a void space or the amount that the container lacks being full) in the load tap changer, a sight glass, and an orifice which establishes an outflow of non reactive gas from the ullage in the load tap changer. Yoshiyuki et al. specifically teach a load tap changer, the on load tap changer is connected to a transformer, the transformer and on-load tap changer are in operative connection, the elements of a transformer are disposed within a tank of oil, as the transformer operates, the art recognized and teaches in Yoshiyuki et al. that gas analysis and gas separation means are in operative connection so that abnormality in oil which will effect the overall performance of the transformer is taught. Yoshiyuki et al. teach gas analysis of the insulating oil in the on-load tap exchanger which includes extracting the oil from the on-load tap exchanger which is then subjected to gas extractor (12) and the gas is then analyzed. The gas extractor is a gas permeable membrane and the oil dissociates through the

film, the gas is then connected to a gas analyzer and the accumulated oil is then pumped back to the on load tap changer. Yoshiyuki et al. do not teach specifically connecting a source of non-reactive gas to the on-load tap changer. This deficiency is taught by Golner et al. who teach introducing the nitrogen at a specific pressure in the ullage of a power transformer wherein the windings of the transformer or elements are submerged in oil. Appellants have argued that Golner et al. do not teach a continuous outflow of gas from the system. It is position taken by the examiner that the from the drawings the shown in Golner et al. that the gas which is introduced into the system includes means for outputting the nitrogen gas, specifically Golner et al. that a pressure control device (54) pressures the nitrogen at a specific pressure at the input, nitrogen is then delivered to the ullage (18) via manifold (60), output port (68), check valve (74) and bleed valve (26). The pressure in ullage (18) changes due to the oil temperature changes caused by transformer loading changes or to changes in ambient temperature, rain or snow etc. The pressure exceed 2.0 psi, bleed valve (26) is set to vent to bleed nitrogen to the atmosphere and it is position taken by the examiner that the apparatus of Golner et al. is fully atmosphere operating such a continuous outflow of non-reactive gas. [Note Column 4, lines 24-38 Appellants are reminded that the rejection is based on the combined teachings of Yoshiyuki et al. which teaches measuring the gas abnormalities of an on-load tap changer, whereas in Golner the nitrogen source is introduced into the ullage of the transformer which is connected with the LTC (on-load tap changer),the combination of references however does render applicant's invention obvious because, there is a clear, teaching and suggestion in the art recognized by both Yoshiyuki et al. and Golner et al. that transformers and on-load tap changers which are as a switch for switching the transformers are systems which are used together, both references teach that the oil in which the windings of the transformer are disposed are subject to deterioration during operation, the oil being used an insulator. The art

recognizes that in order to detect deterioration of the insulating oil, gas analysis of the oil is conducted. In Yoshiyuki et al. gas analysis of the oil is directed monitored and does require a sweep gas or inert gas to be introduced. In Golner, a sweep gas is introduced into the transformer itself which contains the oil; the non-reactive gas is a sweep gas which acts as a carrier in order for gas analysis of the oil to be done on the transformer. Appellants argue that the LTC does not contain oil; however, the LTC is in operative connection with the transformer and it the same insulating oil which is being monitored. The art recognizes that the gas analysis of the insulating oil is required so as to not affect the performance of the transformers. Magnier teach a method and device which prevents explosion and fire of transformers wherein the windings of the transformer are disposed in a mineral oil. A pressure sensor and vapor pressure are coupled to monitor the vapor content of the mineral oil. Magnier teaches injecting a stream of inert gas such as nitrogen to the bottom of the transformer wherein the windings of the transformer are insulated by the mineral oil, the inert gas causes swirling and mixing and the nitrogen acts a carrier gas to flush the vapor generated when the transformer is in use, the nitrogen gas is further introduced to the on-load tap changer so that the expelled gas from the on load tap change can be prevented from exploding using a trigger and gas senor wherein the inert gas is used to expel gases from the fluid contained within the oil of the transformer and on load tap changer. Magnier is another reference which teaches that it is known in the art to provide a gas remover to control an environment in a load tap changer to expel entrained vapor phase contaminants from the ullage in the load tap changer to the atmosphere. It is position taken by the examiner that appellants are arguing each reference individually. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091,

231 USPQ 375 (Fed. Cir. 1986). Appellants are also arguing the operation or the process which control gas from an on-load tap changer, the claims are directed to an apparatus not a process of expelling entrained vapor phase contaminants from the ullage in the load tap changer to the atmosphere. It is the position taken by the examiner that the combined teachings of Yoshiyuki et al., Golner et al. and Magnier fully teach and suggest applicant apparatus as claimed.

With respect to appellant's arguments that the references are non-analogous art, the examiner disagrees, each reference used teaches an on-tap load changer with a transformer, either the on-load tap changer or both the on-load tap changer and transformer are filled with a mineral oil. The fact that Yoshiyuki detects and analyzes the oil does not teach away from applicant's invention, the only deficiency in Yoshiyuki is that an inert gas is not introduced into the on-tap changer, the inert gas as fully explained and argued by applicant being introduced is used as a sweep gas or carrier, however, the art recognizes that the oil in the transformer and on-tap load changer should be monitored as it will significantly impact the performance of the transformer or power requirements of the transformer. In response to applicant's argument that Yoshiyuki is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Yoshiyuki et al. teaches oil filled transformer in connection with an oil-filled on-load tap changer, there is a clear teaching and suggestion in the art as to why one having ordinary skill in the art would be concerned with and conducting gas analysis of the oil and the art is analogous and in the opinion of the examiner reasonably pertinent to applicant's invention.

With respect to appellants arguments that the requisite motivation under 35 USC 103(a) to make the specific claimed combination has not been provided, again it is the position taken

by the examiner that applicant is taking a piecemeal analysis of all of the references and attacking each reference singularly and not for what the combined teachings would suggest to the one having ordinary skill in the art. The art recognizes controlling the atmosphere of the oil filled transformers and oil filled on-tap load changers wherein an inert or non-reactive gas is introduced into the on-load tap changer, the gas from the oil is monitored and gas analysis is conducted and the inert gas acts a sweep gas or carrier in order to expel entrained vapor phase contaminants from the ullage in the load tap changer or transformer itself.

With respect to appellant's arguments that a prima facie case of obviousness under 35 U.S.C. 103(a) has not been established. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the examiner has determined the scope and content of Yoshiyuki et al, Golner et al. and Magnier, Yoshiyuki et al. teaches gas monitoring of an oil filled on-load tap changer which is operative connection with an oil filled transformer, Yoshiyuki et al. does not teach introducing an carrier gas or sweep gas or inert gas nitrogen to the on-load tap changer. Golner et al. teach introducing a nitrogen stream (which is a non-reactive gas) to an oil filled transformer, the transformer being in operative connection with an on-load tap changer, the LTC is not oil filled, the system as described by Golner teaches why one having ordinary skill in the art, would introduce nitrogen into the oil filled transformer and to remove and prevent over pressuring of the oil filled transformer and LTC system. Magnier as discussed above teaches oil filled transformers and LTC systems wherein a nitrogen gas is introduced into the system and removed and wherein the withdrawn the gas is monitored to

prevent explosion or performance of the transformer/LTC. The examiner has shown and described the differences in the prior art and the claims at issue and although argued by appellants that the art is non-analogous, it the position taken by the examiner that the art is analogous and on point and there is a clear recognition in the art why the gas/oil filled transformers and on-load tap changers have to be monitored, because there are some cause and effects which will ultimately affect the overall performance of the transformer and/or on-load tap changer (LTC). From reading Yoshiyuki et al, Golner et al. and Magnier all of the art is pertinent and the level of skill in the art has been established. Appellants have not argued the limitation of the sight glass and this feature is either implicit in the transformer and/or on-tap changer but a sight glass is not a limitation which would impart patentability to the system. With respect to applicant's dependent claims, regarding the filtration system to filter air entering the nitrogen generator, the air compressor, the membrane the venting etc. are elements of the system which have been taught in Yoshiyuki et al., Golner et al. and Magnier and are elements which are obvious to one having ordinary skill in the art at the time the invention was made. It is the examiner's position that the combined teachings of Yoshiyuki et al., Golner et al. and Magnier renders applicant's system obvious as a whole to one having ordinary skill in the art at the time the invention has been made and the examiner has satisfied the burden of establishing a prima facie case of obviousness as the art and the combination and why the combination has been made has been objectively presented to appellants and has satisfied the conditions set forth in *Graham v. John Deere Co.* 383 U.S. 1,148 USPQ (459) (1966).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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